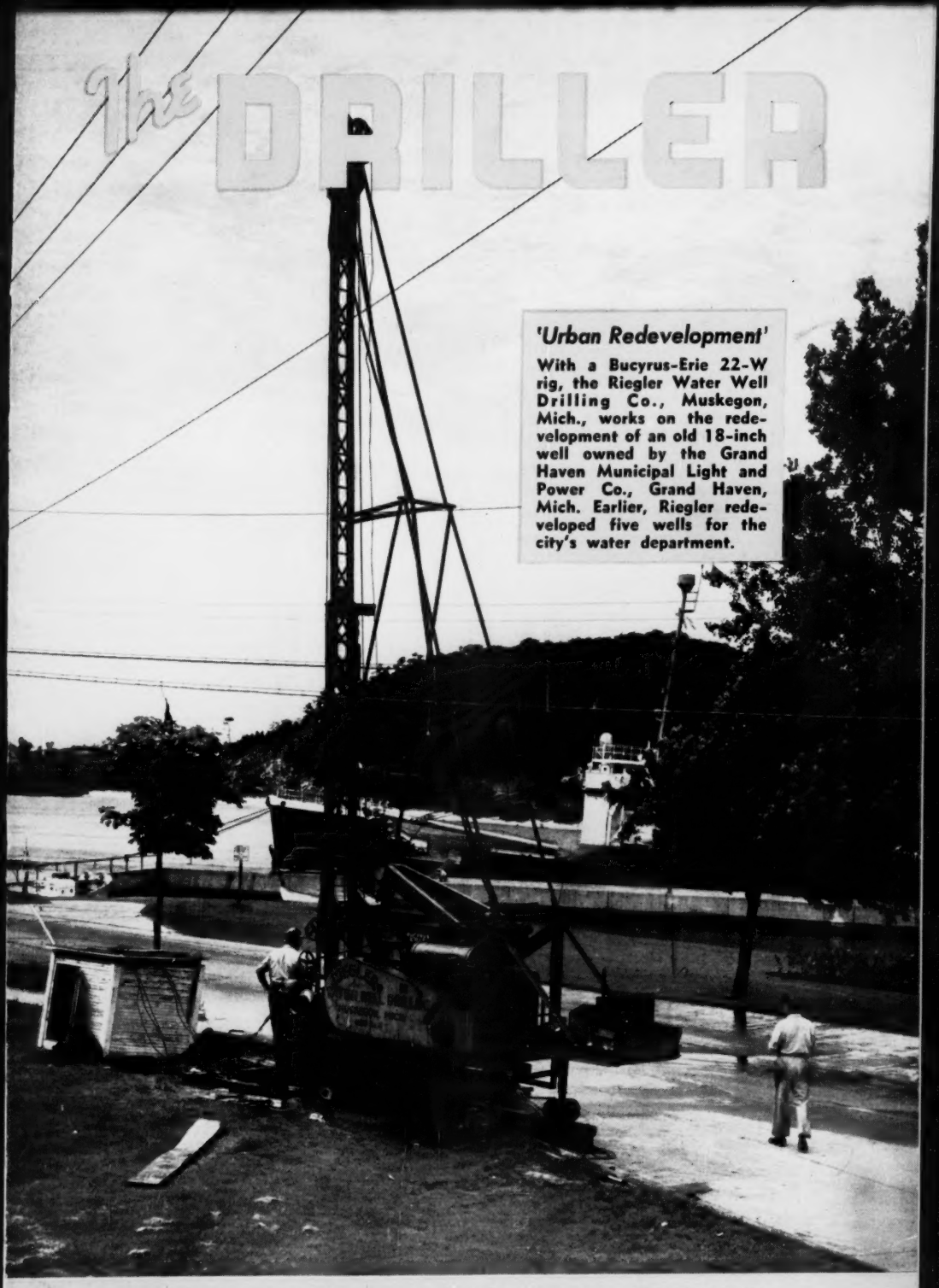
The DRILLER



'Urban Redevelopment'

With a Bucyrus-Erie 22-W rig, the Riegler Water Well Drilling Co., Muskegon, Mich., works on the redevelopment of an old 18-inch well owned by the Grand Haven Municipal Light and Power Co., Grand Haven, Mich. Earlier, Riegler redeveloped five wells for the city's water department.

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VOLUME 23 OCTOBER, 1949 NUMBER 10

"IT'S A SETUP"

To rig up a Bucyrus-Erie 22-W

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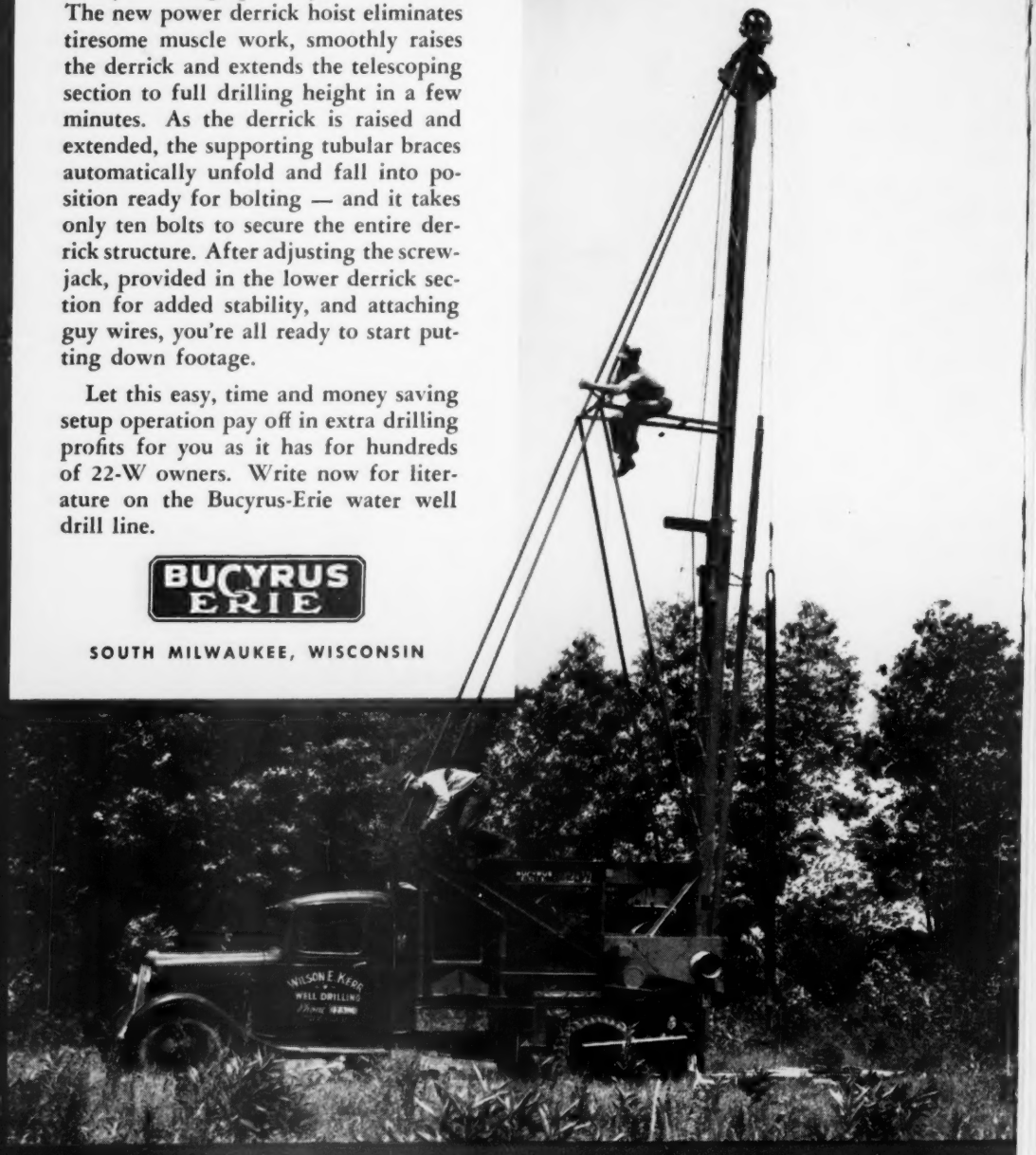

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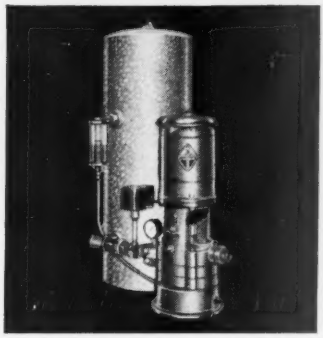

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FOR DEPTHS TO 40' AND GREATER, Jacuzzi Speedi-Prime injector-type pumps and water systems with capacities to 2400 gallons per hour.

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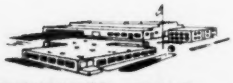

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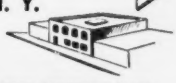


FOR COMPLETE INFORMATION WRITE OFFICE NEAREST YOU

JACUZZI BROS. INC.

WRITE FOR NAME OF NEAREST DISTRIBUTOR

• In putting down most of his tubular wells, the Indiana contractor uses this 450-pound, cast iron maul.

• Snellenberger and his helper, Harry Kelsey, connect up the hose and piping used to supply water in the jetting process.

• While Kelsey takes log samples, Snellenberger guides the one-inch drill rod, used in putting down two-inch wells, into the hole.

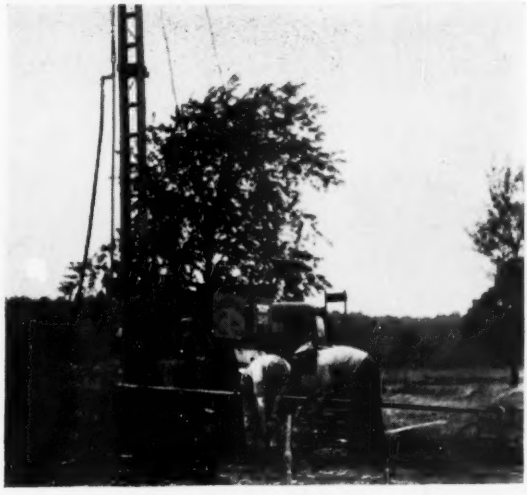
DRILLING IN SAND AND GRAVEL COUNTRY

Here's the story of a driller who handles both jetting and solid tool work, and handles them equally well. It's an account of the drilling experiences of Charley Snellenberger, a driller who takes such deep professional pride in his work that he strives to drill a better well for every customer.

SAND and gravel country is a fit title for that section of the Midwest embracing northern Indiana and southern Michigan. No one knows this better than Charley Snellenberger, a South Bend, Ind., drilling contractor, who has tangled with the area's sand and gravel formations and blue and yellow clay deposits for the past five years while putting down "tubular wells."

Most drillers know how to drive down a "tubular well" as a matter of course. This method of drilling is in use daily in many parts of the country where a pipe with a pointed screen on the end of it can be driven to water easily. When the conditions are right, the driller can install a well by merely using a piece of pipe, some driving caps, a heavy maul and elbow grease.

Knowing that he can get water anywhere in the territory he covers —within a 50-mile radius of South Bend—by putting down a 2-inch well, Snellenberger concentrates on giving each of his customers the best well drilling job he can. Ninety-five per cent of his wells are two- and three-inchers.



• The two drillers refuel the gasoline-driven Gorman-Rupp pump used to force water into the pipe under pressure in drilling out the well.

• With a Bucyrus-Erie 21-W, Snellenberger puts down a two-inch tubular residential well for a suburban home located on the outskirts of South Bend.

Using an Ideco 10 and a home-made rig, Snellenberger drilled 150 wells during 1948, the biggest share of them being residential wells for farm and suburban homes. Early this year he purchased a new Bucyrus-Erie 21-W to replace the rig he built himself, mounting the drill on a 1946 1½-ton Ford truck which is equipped with a two-speed rear drive.

At present, the Indiana contractor uses the 21-W for all of his small diameter work because "it is a lot faster in setting up, taking down, and moving to the next job." He has his Ideco rig mounted on a 1937 1½-ton Ford truck and uses it only for four-inch wells and larger.

His other piece of mobile equipment is a 1945 ½-ton Ford pickup truck which he uses for hauling tools, pipe and other equipment to the job together with two 55-gallon steel drums. The latter hold the supply of water which is used in the jetting process.

In his work, Snellenberger has also put down some air-conditioning wells, and a few for irrigation purposes. One of the former — a six-incher for South Bend's Delmar Club —is only 32 feet deep. This shallow well produced 60 gpm under test, showed no drawdown, and had a static level of 14 feet.

While the average well depth in their section of the country is 50 feet, Snellenberger and his helper, Harry Kelsey, drilled a two-inch residential well 170 feet deep last May. This is the deepest one they have driven thus far.

The job site in this instance was alongside a lake home, located on

the shores of Barron Lake, Mich., about 15 miles northeast of South Bend. The well, according to the contract, was to be put down about 15 feet from the house but the pump was to be installed in the basement.

Finish Job in 1½ Days

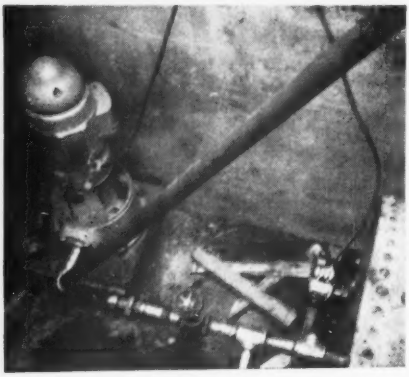
Using the 21-W rig, Snellenberger and Kelsey moved in on the job, set up the machine, drilled the well, tore down, and moved on to the next job all in 1½ days. They drove 160 feet of pipe in one working day—their best record for two-inch pipe to date. (The most four-inch pipe they have put down in a single day is 60 feet.) Later, Snellenberger also installed a Myers ½-hp centrifugal jet shallow well pump for the customer.

Snellenberger has just completed another two-inch tubular residential well, in St. Joseph County, Ind., which went down considerably below the 50-foot average depth. This well was being driven in an old corn field on the outskirts of South Bend, alongside the proposed site for a suburban home. With Kelsey, he had driven down 108 feet of pipe when his log samples still showed considerable blue clay.

At this point they started drilling again, cleaning out the pipe already set and going on down ahead of the casing right through the blue clay formation. When they reached a depth of 115 feet, the formation began changing suddenly to gravel, and at 118 feet they had passed completely out of the clay and were in a water bearing formation of gravel.

Having drilled a well on an adjacent lot a few weeks before, Snellenberger knew that this formation of a better grade of gravel was not too great in depth, that a few feet deeper it would shift again to a coarse grade of sand. So he decided to drive the casing down to 120 feet, drill out, and set a 125-60 Clayton Mark screen with an 18-inch set-length at from 120 to 124 feet. Having done this, he and Kelsey drilled down to the 124 foot depth and washed out as much of the loose gravel as possible. Pulling out the drill rods, they dropped in the screen and set it. Then, a check valve was inserted in the hole and set, and the well was ready for pumping.

• A Cook turbine pump installed in a well pit at a depth of approximately 70 feet. This well produced 45 gpm.



Set Plunger on Drill Rod

Instead of setting a pump on a new well to pump it off, Snellenberger merely places a plunger on the end of his drill rod and pumps the well off with his rig. On this job, he had a clear flow of water with no trace of sand 20 minutes after he began pumping. The well tested at a rate of 720 gph. It was later equipped with a ½-hp Cook ejector type pump with a 42-gallon tank.

In putting down most of his "tubular wells," the Indiana contractor uses a 450-pound, cast-iron maul. After driving down a length or more of pipe, he drills out the well by forcing water into the pipe under 25 pounds of pressure, produced by a small gasoline-driven 1½-inch Gorman-Rupp pump. The water is forced through a one-inch drill rod

• **Snellenberger jacked up his 21-W rig to get to the well in this job. The owner wanted to change the screen in his two-inch, 80 foot farm well.**

which is attached to the drilling end of the jet hose. The one-inch drill rod is used only in putting down two-inch wells. In drilling three-inchers, a 1¼-inch drill rod is used.

In his business, Snellenberger also handles the installation of pumps and water systems when customers want them. He doesn't specialize in any one make, however, installing the Cook, Deming, Jacuzzi, and Myers lines as the occasion demands.

Unexpected troubles turn up in most drillers' well drilling activities, and Snellenberger is no exception. One of his most difficult jobs occurred while he was putting down a four-inch, 120-foot residential well with sol'd tools near Michigan City, Ind. The finished well came in with so much pressure that its flow couldn't be stopped. Since he had driven down into a formation of fine sand containing no gravel whatsoever, Snellenberger knew the well wouldn't shut itself off. Stopping the gushing water was his problem.

"If I had tried to stem the flow," he said, "the water would have shot out of the top of the pipe, 30 or more feet above the ground. Because I knew I was drilling in that fine strata, I realized there was no other way out but to drive to the bottom of that water bearing strata to shut that flow off."

With water and sand flying all over, the South Bend driller drove down approximately 30 feet of casing until it penetrated a formation of blue clay, shutting off the flow. His next problem was how to put a strainer in the well and hold it in place, while pulling the pipe back to expose the screen.

Jacks Pull Back Pipe

After some study and discussion, Snellenberger decided to set 100 feet of four-pound pipe on top of the strainer and the drill stem on top the pipe. Thus, approximately 1,000 pounds were holding the strainer in place. He then used jacks to pull the pipe back instead of bumping it back with the rig.

After Snellenberger had pulled the pipe back one foot, the water started to flow freely — the flow growing

(Continued on page 25)

A BRIEF REVIEW OF THE WATER SITUATION IN THE LONE STAR STATE

By Ervin Hickman

The matter of water conservation in west Texas is rapidly becoming a major problem for State officials. Here's a detailed report on the matter, presented from the farmer-rancher approach.

MAN's quest for water dates back to Biblical times. Most of our earliest civilizations were centered around water—either springs, rivers, or wells. According to Tolman in his book "Ground Water," "primitive man was taught to dig for water, possibly by observing the action of wild horses and coyotes in search of water. As soon as he learned to domesticate and rear cattle and sheep, the well became his most important possession."

Many incidents, illustrating the importance of ground-water supplies to the tribes of Israel, are also recounted in the Bible. Abraham and Issac were renowned for their success as well diggers (Genesis 26:17-23). In Ecclesiastes (2:6) reference is made to King Solomon's well. And Jacob's well (John 4:6) is one of the few localities mentioned in the Bible identified by all authorities.

All these wells played an important part in the history of nations because the occurrence of water necessarily controlled the activities of man. The digging of wells became an integral part of life for city dweller, farmer, and rancher.

Through the years, drilling methods have been improved constantly and have led to a gradual change from dug to drilled wells. People, too, are becoming more water conscious every day. The development and use of ground water was never greater than it is today. Because of its size, Texas has been singled out by THE DRILLER for a review of the water situation there.

As early as 1855, the United States Government had made explorations for water on the plains. In his book, "Texas, The Lone Star State," Rupert Norval Richardson, Professor of History at Hardin-Simmons University, tells how Capt. John Pope drilled a well where the Texas-New Mexico boundary crosses the Pecos.

"Some of the plains railroads drilled and secured underground water, but they had to use steam power to pump it. Gradually the pioneers discovered water by digging or drilling wells. In 1881, Quaker colo-

nists dug wells in Blanco Canyon and found comparatively shallow water. That same year a well-drilling outfit in the San Angelo country reported several good wells.

"The next year a well was drilled in Schleicher County, said to have been the first on the Edwards Plateau. In 1884, a cattleman had six wells drilled on his land in Lubbock County and proved that wells with windmills were practicable for watering cattle."

Large Ranches Up Demand

Today, in Texas, the development of large ranches has made the pumping of ground water one of the major industries. With an increase in the use and demand for ground water there has also been an increased draft on available ground water supplies, so much so that there has been a steady lowering of the water table.

Down on the famous King Ranch in south Texas, the dwindling water supply is becoming a problem, according to Dr. James K. Northway, King Ranch veterinarian. "A cow drinks 10 gallons of water per day, and it takes plenty of water to grow the grass they eat," he pointed out. This ranch ships 20,000 cattle to market each year.

Water Table Drops

Dr. Northway further mentioned that in 1916 many artesian wells were flowing, but that in some wells around Kingsville, water is 117 feet below the surface at the present time, which gives an idea of how the water table has dropped. There are 75 artesian wells and 225 windmills watering 80,000 head of cattle and 2,800 quarter horses on the ranch.

From a farm and ranch angle, further uses of water and water well drilling are indicated by the fact that many sections of land in the so-called "High Plains" area of Texas are being put into cultivation by drilling irrigation wells. This is also applicable in the Fort Stockton, Marfa, Alpine, and San Angelo areas.

The Department of the Interior is authority for the information that the "High Plains" area is due for a shortage of water in the next five to ten years. Geological experts in the department say that the "pumping of ground water for irrigation is still increasing rapidly, and water levels are declining in the areas of heaviest withdrawal." The officials estimate that 10,000 wells were used in 1948 to irrigate more than a million acres of crops in the southern "High Plains."

Sprinkler irrigation systems, dependent on large water wells, are being used to feed out cattle in many sections of west Texas. Perennial grasses are used, and there you have a perfect setup in which a cattleman can operate a ranching venture without depending on rainfall.

200-Ft. Irrigation Well

At Marfa, Texas, rancher H. A. Coffield has a well more than 200 feet deep. If this well produces enough water, he will plant a portion of his 10,000 available acres to feed. On the Harrison Beauchamp farm at Pecos is located a water well that is perhaps the best in that irrigated farming section. The well produced 2,300 gallons of water per minute on a 10-hour test from a 100-foot level.

Since the "High Plains" area currently is more concerned with the water situation in Texas, it might be well to refer to some information compiled by the Texas Board of Water Engineers in their "Progress Report" for the period of September 1, 1946, to August 31, 1948. This report, in brief, has a table on the number of wells operated, acreage irrigated, and acre-feet pumped in

(Continued on page 22)

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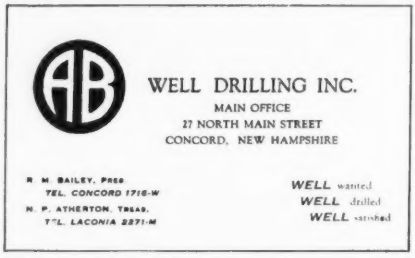
For Landing Jobs, Business Card Advertising Pays

WITH the water well drilling industry becoming highly competitive again, more and more drilling contractors realize that they must do some advertising to land their share of the new jobs. These drillers "plug" the services they have to offer prospective customers through various means. And, many have found the tiny "business card" to be one of the better mediums for making residents of a community conscious of their drilling ability.

Recently, a business card was sent to THE DRILLER by the A & B Well Drilling Inc., Concord, New Hampshire. We consider this to be an attractive card for well drillers, and are reproducing it here for your benefit.

An attractive business card like this adds just a little bit more to that first "hello" you offer the prospect. Second, a business card suggests to that prospect that you run your business in an orderly and efficient manner. Third, the card can be circulated by influential friends to those who



show interest in buying a new well. And, finally, the card can be left with your customers and they, in turn, can pass it on, becoming active boosters of yours.

The card, of course, is only a small part of a well organized effort to publicize your business. It is, nevertheless, an important one because it's very often the first contact made with the prospect. THE DRILLER will be glad to help other drilling contractors work out a card of their own.

Set Up Irrigation Area in Oklahoma

THE establishment of a relatively new irrigation area near Duke, Oklahoma, is reported by Edwin W. Reed in the July issue of Water Resources Review, a monthly publication of the United States Department of the Interior Geological Survey. The first successful well was drilled in that section of southwestern Oklahoma in 1912. By 1948, eight wells

(Continued on page 21)

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NEWS OF THE MONTH

Texas Barbecue Set For Oct. 1

THE Texas Water Well Drilling Contractors' Association will hold a barbecue at the White Oak Gun Club, Houston, Texas, from 1:00 pm until 10:30 pm, October 1. A. E. Fawcett, Jr., president of the association, invites all water well drilling contractors, their wives and children to join in the fun.

Stewart Appointed To Succeed Neely

THE promotion of C. Earle Stewart, Williamstown, West Virginia, to the position of district representative, well drill sales, for the Evansville, Indiana, sales district, has been announced by Bucyrus-Erie Co., South Milwaukee, Wisconsin. Stewart, who succeeds Henry C. Neely as of October 1, will continue to make his headquarters for the present at 444 Highland Avenue, Williamstown.

To his new position, Stewart brings over 25 years of experience in the water well, oil and gas drilling fields. Having served in the capacities of tool dresser, driller, and drilling superintendent, Stewart is thoroughly familiar with the application and operation of drilling equipment. More recently, he traveled Michigan, Ohio, Virginia, and West Virginia as drill sales representative for the line of water well drills and tools manufactured by Bucyrus-Erie.

Neely, whose resignation became effective September 30, will be associated in an executive capacity with the Randall-Zogg Supply Co., Owensboro, Kentucky, and Princeton, Ind. Randall-Zogg has sold and serviced Bucyrus-Erie oil well spudders for the past five years and was recently named a distributor for the popular line of Bucyrus-Erie water well drills —Models 20-W, 22-W, and 24-L—in western Kentucky, north central Tennessee, southwestern Indiana, and southeastern Illinois.

Neely is well-known throughout the water well drilling industry and throughout oil field circles in the Eastern and Illinois Basin areas. For many years he was associated with the Armstrong Mfg. Co., Waterloo, Iowa, serving as eastern sales manager for the Iowa firm prior to its merger with Bucyrus-Erie in 1933. Neely then joined the drill sales division of the South Milwaukee company, serving as eastern sales representative for Bucyrus-Armstrong drills before being named to a similar position at Evansville.

Poor Stream Flow Prevalent in East

THE drought that began in April in the northeastern states and provinces continued unabated in July, according to the Water Resources Review issued by the U. S. Department of the Interior Geological Survey. At seven key gaging stations, stream flow was the lowest on record for the month. Ground-water levels continued their downward trend generally, reaching levels far below normal over most of the region.

In Maine, for example, month-end ground-water levels averaged about a foot below normal as indicated by

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measurements at five points in various parts of the State. Stream flow receded rapidly, and at the end of July was generally about 50 percent of normal.

On the other hand, the bulletin reported excessive stream flow over a broad region extending from Lousiana to Florida and along the east coast as far north as West Virginia and Maryland. Widespread heavy local showers contributed to the peak flows. Two index gaging stations, located in Virginia, reported the highest runoff on record for July.

In the West, stream flow was generally excessive in the Colorado River Basin during July, and flow of the Rio Grande was also high. In contrast, the flow of the Columbia River and its northern tributaries was deficient.

New Drilling Rig Announced By Bucyrus-Erie Co.

Production of a new water well drill—the 20-W—especially designed for profitable one-man operation is announced by Bucyrus-Erie Company, South Milwaukee, Wisconsin, world's largest manufacturer of water well drills. Smallest of the popular line of Bucyrus-Erie rigs, the 20-W is in a performance range that lets owners handle a variety of farm, home, and small industrial well drilling jobs. It puts down holes to 500 feet; drills wells from 4 to 6 inches in diameter and handles up to 1200 pounds of tools.

For faster and more economical well drilling, the manufacturer claims the 20-W has more big machine features than have ever before been offered on a drill of this size. Outstanding among these are the 32-foot box-section welded derrick with a power hoist; gear-driven bull reel; automatic drill line feed; friction driven sand reel; counterweighted spudding gear; slack line holder; tool carrying equipment. Handy cat heads and a gear-driven casing reel are available as extra equipment. As is the case with the larger Bucyrus-Erie drills, the 20-W may be had with either a semi-trailer or truck mounting.

The new 20-W supplants the manufacturer's model 21-W, long a favorite with drilling contractors throughout the world. In addition to the 20-W, Bucyrus-Erie will continue to offer its larger water well drills—the 22-W, 24-L and 28-L.

Pumps Described In New Booklets

TWO illustrated booklets, dealing with the company's line of oil and water lubricated pumps, were recently released by the Johnston Pump Co., Los Angeles, California. Their text deals with the applications for which the firm's turbine pumps are designed, explains interchangeability of parts, and by means of sectional drawings shows the component parts of the pumps and their relation to each other.

The booklets can be obtained by writing to the Johnston Pump Co., 2324 E. 49th St., Los Angeles 11, Calif.

Warkentin Resigns As Okla. Secretary

WORD of the resignation of E. C. Warkentin, Oklahoma City, as secretary of the Oklahoma Well Drillers Association was recently received. Warkentin, who held the post since the group's formation last January, has taken a position with the United States Public Health Service on the Stream Pollution

Use

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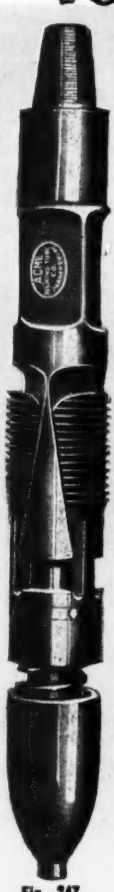

Fig. 247 Acme Trip Casing Spear

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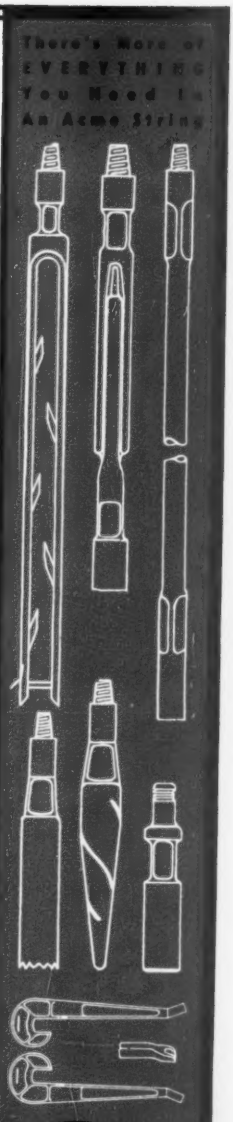
Its vital parts are of special alloy steel. Full circle hitch, prevents oblonging when jarring . . . Long slip seats and finger-trip ring assure non-breakable slips . . . 3, 4 and 8 slip styles . . . Quick-setting, positive action tripping device, for various pipe weghts.

From billet to finished Spear, every detail confirms Acme's ultra-qualities' tradition: PREMIUM grade steel, to most rigid analysis specifications . . . CORRECT heat-treatment, to exactness of electrical automatic controls . . . Craftsmanship of half-century specialized experience backlog.

Acme Casing Spears are STANDARD with hundreds of top-flight Drillers everywhere . . . Because the accumulated know-how of our own fishermen puts in that EXTRA inner-ruggedness so essential to longer, harder field service.



If you don't have Acme's new Catalog and Manual — expressly compiled and chock-full of valuable information for Water Well Drillers — mail penny postal TODAY for your copy.

Fig. 247 featured above is one of 78 Acme TRUSTWORTHY Cable Tools shown in new Catalog for Water Well Drillers.

Acme Fishing Tool Co.

PARKERSBURG, W. VA.

ACME DRILLING & FISHING TOOLS

Since 1900

Now you can sink a jet 300 feet down...

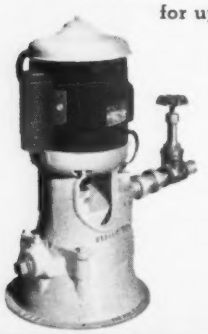
if it's a

BERKELEY

2-STAGE
EXTRA-DEEP JET PUMP

Promise your customers dependable performance from levels down to 300 feet

New jet design and higher motor speed—features of these new 2-Stage Berkeley Pumps—produce maximum performance with lowest horsepower requirements. The Berkeley Extra-Deepwell Jet Pumps develop higher pressures at shallower settings...are ideal for uphill pumping jobs.



Let us send you a table of performances for this new Extra-Deepwell Series. See for yourself how these BERKELEY Pumps can solve your customers' deepwell water problems economically and efficiently.

BERKELEY PUMP COMPANY

829 Bancroft Way, Berkeley 2, California

Abatement Program. L. J. Clarke, assistant sanitary engineer of the Oklahoma State Department of Health, will serve as this group's secretary until the next general meeting of the association.

The association's directors are considering the holding of a two-day meeting this Fall, a feature of which will be an exhibit of equipment of interest to the water well drillers. The time and place of this meeting will be announced later.

New Florida Distributor Named

THE recent appointment of Earl E. Van Every, Orlando, as distributor for Bucyrus-Erie water well drills in Florida is announced by Bucyrus-Erie Co., South Milwaukee, Wisconsin. He will handle the models 20-W, 22-W and 24-L, known throughout the world for their efficiency and mobility.

In selling and servicing the popular line of cable tool drills, Van Every brings to Florida drillers his long experience in the water well drilling industry. Among former positions held by him are those of vice-president, general manager and secretary of the well-known Butler, Pennsylvania, manufacturing firm, Larkin & Co., Inc.

Contractors wishing competent assistance in handling their drilling problems may contact Van Every at P. O. Box 2804, Orlando.

Johnston Makes Executive Changes

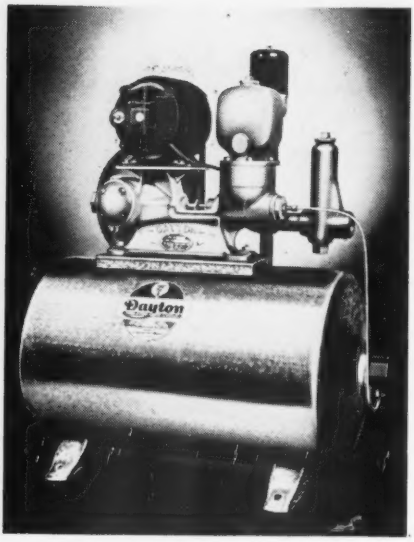
TWO recent personnel changes in the firm's main office have been announced by the Johnston Pump Co., Los Angeles, California. T. W. Simmons, Jr., has been elected vice-

LONG WEARING STEELS

...Used in *Bucyrus-Erie* Drilling and Fishing Tools give you more service for less money!

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



MODEL 250-H17

A NEW Dayton
SHALLOW WELL WATER SYSTEM

RETAILING FOR ONLY $91.00

F.O.B. Dayton

Here's a 250 GPH capacity fully automatic, completely assembled "package" Water System that retails for only $91.00. Ideal for small homes, cottages, service stations, etc. Easy to install. Comes with oil sealed-in, ready to plug in.

Pumps from shallow well, stream, lake or cistern where water level is not more than 25 feet below pump.

It is equipped with a ¼ H.P. Motor, 17-gallon galvanized pressure tank, air volume control, pressure switch and relief valve. Write for complete details.

Dayton

Water Systems & Softeners

THE DAYTON PUMP & MFG. CO., DAYTON, OHIO

president and general manager of the company, and Kenneth G. Lundie has been appointed general sales manager.

Simmons, until recently, was president of the Johnston Aquamatic Co., York, Pennsylvania. Lundie has been connected with sales in the turbine pump business for over 25 years. He formerly was western sales manager of the Pomona Pump Co., Pomona, Calif., and was in charge of sales for the C. J. Hammer Co., Visalia, Calif.

New Turbine Pumps Made By Berkeley

A NEW water-lubricated four-inch deep well turbine pump, to be known to the trade as the "Crusader," was recently announced by the Berkeley Pump Co., Berkeley, California. According to the manufacturer, it was designed to fill the gap between the company's line of jet pumps and its larger turbines.

One of the more desirable features of the "Crusader," Berkeley claims, is the low operating speed of 1,750 rpm made possible by the firm's special patented construction. Pump capacities, it is said, range from 15 to 80 gpm from depths to 300 feet.

Further information can be obtained by writing directly to the manufacturer at 829 Bancroft Way, Berkeley, Calif.

Add Water Systems

FLINT and Walling Mfg. Co., Inc., Kendallville, Indiana, has announced two new additions to its line of compact water systems. One, called the Varijet Bullet, is a shallow well centrifugal jet package system. The other is a piston-type package unit.

According to the manufacturer,

Install

PLASTIC CORROSION PROOF SEAMLESS WELL CASING

in MINUTES instead of HOURS

CARLON PLASTIC WELL CASING is rugged, lightweight and economical to handle and install. Standard seamless 20 foot lengths are furnished from stock in 3-, 4-, 5-, 6- and 8-inch diameters, light or heavy wall. Straight or swedged ends. Perforated Carlon Casing 1″ x 1/16″ slots furnished when desired.

CARLON PLASTIC IRRIGATION PIPE for low pressure installations is best for dependable long life service. Easily attached cemented plastic sleeves and threads carried in stock. Acid and alkaline soils will not rot, rust, corrode or scale Carlon Pipe or Seamless Well Casing.

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Manufacturers of Extruded Products

***In Canada:* Micro Plastics Ltd., Acton, Ontario**

the Varijet Bullet is designed for installation in cottages, cabins, and small homes where the water lift does not exceed 25 feet. It is claimed further that the ¼-hp pump will deliver from 110 to 800 gph depending on suction lift and discharge pressure.

The 1/6-hp single cylinder, double-acting piston-type pump is also built for shallow well installation, the manufacturer asserts. It is designed for capacities of 225 gph and for lifts not over 22 feet. Write the manufacturer for complete information.

Westinghouse Make New Pump Motors

NEW type CSP Life-Line motors, especially designed for deep well turbine pumps, have been announced by Westinghouse Electric Corp. According to the manufacturer, these weatherproof, vertical hollow-shaft motors can be furnished as a complete motor, a motor without base, or as a stator and rotor only. They are of the squirrel cage induction type.

Westinghouse has indicated that typical uses of these motors include irrigation work and municipal pumping stations. Further information can be obtained by writing directly to the manufacturer, Box 868, Pittsburgh 30, Pennsylvania.

Brothers Killed in Well Mishap

TWO brothers, cleaning out a caved-in well with a pump, were electrocuted early in August when the pump and pipe came in contact with an overhead high voltage power line. They were Robert Hagler, 31, and Paul W. Hagler, 22, both of Carbondale, Illinois.

They were working on a well at Paul's home, a mile and a half south of Carbondale, when the mishap occurred. Paul's wife, seeing a great flash, went out and found them dead. The two brothers are survived by their wives and by their parents, Mr. and Mrs. Frank Hagler.

Oster Announces New Pipe Threader

A NEW threading machine, to be known to the trade as the Oster No. 702 "Wilco," has been announced by the Oster Mfg. Co., Cleveland 3, Ohio. The company has stated that a speed selector switch and push button controls for stand-

ard voltages are among the machine's time-saving features. Faster threading and minimum handling of stock are made possible, it is claimed, by a three-speed motor and other features.

Regular pipe range for the Wilco is ¼ inch to two inches. Extra pipe range is ⅛ inch, and bolt range is ¼ inch to 1½ inches. Further information can be obtained from the manufacturer upon request.

Irrigation Area . . .

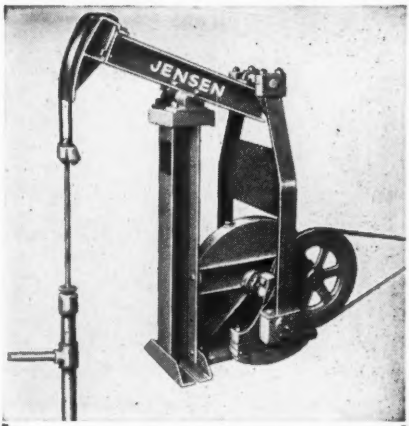
(Continued from page 10)

were in operation from which approximately 400 acre-feet of water was pumped. During 1949, at least 22 wells will discharge about three times that amount. No significant change in water level during the past season has been observed.

The wells range from 43 to 115 feet in depth. Water is derived from the lower part of the Blaine formation, which lies at or near the surface in the Duke area. This formation consists of gypsum, shale, and some dolomite. The gypsum is cavernous, and many sinkholes, which drain a large portion of the overland runoff, are visible.

Yields up to 1,700 gpm have been measured. The yields from individual wells vary greatly, however, depending upon the number of cracks, crevices, or cavities encountered by the drill. In some places, several holes have been drilled before a yield large enough for successful irrigation was obtained. The yield from a few of the smaller wells has been greatly increased by treating the well with hydrochloric acid.

According to Reed, the Geological Survey will revisit the area at least once a year to check water levels, inventory new wells, and make estimates of the quantity of water pumped during the previous season.



Pump Handle Pete Says:

A mighty good word "KNOW"

Instead of "NO" it's best to "KNOW" where to put a Jensen Jack so it'll do your customers the most good. Jensens are rugged, simple, dependable and economical. As a matter of fact on most wells over 100 ft. deep you just can't recommend a better unit than a Jensen.

Let us show you. Send a penny post card to 1016 Fourteenth Street, Coffeyville for FREE literature. One look and you'll be in the "KNOW."

JENSEN

BROTHERS MFG. CO.

COFFEYVILLE, KANSAS, U.S.A.

SELL DEMING FEATURES

• You, in your profession of well drilling, are looked upon as the best judge of pumps and water systems in your community. You know what to look for in a pump. That is why we believe you will be interested in having a new booklet which gives a graphic picture of the outstanding features of Deming Pumps and Water Systems. You will see at a glance the IMPORTANT Deming Features that assure your customers the BEST VALUE for their investment. Don't delay . . . write for this helpful new booklet NOW!

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512 BROADWAY • SALEM, OHIO

DEMING
THE COMPLETE LINE
PUMPS AND WATER SYSTEMS

Texas Water . . .

(Continued from page 9)

the "High Plains" area for the dates shown above.

In 1937, for instance, 1,150 wells were in operation. They irrigated 160,000 acres and had a pumpage, measured in acre-feet, of 130,000. In 1948, there were 8,500 wells irrigating 1,000,000 acres with a pumpage of 1,000,000 acre-feet.

This region, according to the same report, occupies 35,000 square miles. "Most of the available supply of ground water in the 'High Plains' area occurs in the sands and gravels in the Ogallala formation of Tertiary age, which covers most of the surface of the Plains and rests on an uneven floor of older rocks," said the report.

The increased use of water on farms and ranches is reflected, too, in quantity of water currently available for municipal supplies. Lubbock, for example, got enough rainfall last May to furnish an ample supply of water for the city for the next 433 years, if the statistics given by the Lubbock Journal can be used as a yardstick. The city of Coleman, to the southeast, "borrows" 40 carloads of water (400,000 gallons per day) from the neighboring city of Brownwood. And Bill Moore, mayor of a third city, Ballinger, has indicated that municipal wells and a lake are taking ample care of the water supply there.

H. N. Roberts, Lubbock engineer, told delegates to a Texas sectional meeting of the American Society of Civil Engineers, held at San Angelo in early spring, that "the problem of an ever-increasing demand for water is not unique with plains cities so far as the state-wide picture is concerned, but that the supply of water in the plains area is almost totally from wells. Because of this, there is not only a problem of finding

more sources of supply but also one of hardness."

Roberts pointed out that consumption from 1928 to 1941, inclusive, varied from a low of 205 gallons per meter per day in 1928 to 295 gallons in 1939, an average of 264 gallons. After 1941, however, it increased relentlessly to a 465 gallon average in 1948.

"Before the competition for ground water started on the South plains," Roberts declared, "it was the custom to contact the owner of the land and purchase for a fee simple a small tract of land, probably 100 feet square or less for each well."

But now water rights enter into contracts. "I have seen yearly rentals of one to five dollars per acre per year asked and paid," he said.

The President of the West Texas Chamber of Commerce, John D. Mitchell, has pointed out the economic loss sustained both from lack of water, in some instances, and from floods in others.

Study Proposed Code

"Due to our objections to the proposed surface water code (now in the act of being worked into legislative action by the Texas Legislature), and also to other projects," Mitchell said, "it appears now that the proposed code is being held in abeyance for further study by an interim legislative committee.

"With the state having no inventory of our surface water; no definite formula for alloting such waters; no exact definition of riparian rights or stream flow, and since there exists a crying need among our cities for domestic water, while nine times as much water is being appropriated for hydro-electric power as for domestic use, and great quantities of our surface waters escape to the Gulf, there can be no doubt that such an inquiry should be fruitful for the state."

JOHNSON
Right Angle DRIVE

It's the INSIDE that Counts

Yes, it is the years of experience "built-in" on the "inside" of the Johnson Right Angle Gear Drive that counts.

These Drives have outstanding engineering features that pay big dividends by delivering unfailing service day in, and day out. Check these features with the man who owns a Johnson Right Angle Drive . . . point by point they excel in

- MODERN DESIGN
- COOLER OPERATING TEMPERATURE
- LUBRICATION OVER WIDE SPEED RANGE
- QUIETNESS OF OPERATION
- ALL WEATHER SERVICE
- COMPACTNESS
- EFFICIENCY
- LOW COST OPERATION

Get the facts. Ask your local Pump or Engine Manufacturer's agent for details. Write us for Free illustrated folder showing installations all over the U. S. on farms and in industry.

JOHNSON GEAR
AND MANUFACTURING CO.
"44 years of Engineering Service"
931 Parker Street • Berkeley, California

FROM THE MAILBAG

This page is open to any of our readers having questions to ask relating to drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space will permit. Address: The Driller, South Milwaukee, Wis.

Dry Ice for Development of Wells

Dear Sir:

Will you give me some information regarding the use of dry ice for the development and reclaiming of water wells? I have read some on it and I want to try some method to open up channels of water for reclaiming wells, as there are quite a number of them here.

W. N. R. **Tennessee**

We do know of several instances in which dry ice has been used successfully in developing and reclaiming water wells but no definite technique has been worked out which guarantees positive results in all cases.

Dry ice is particularly effective in cleaning out the perforations of a well casing or screen which has plugged up from incrustations, forming a solid coating over the pipe or screen.

Chemically, dry ice is carbon-dioxide gas pressed into a solid form. When dumped into the water in a well, the dry ice changes from a solid form to a gaseous form rapidly and with considerable pressure. This pressure sets up a surging action in the well casing or screen, thus forcing the water back and forth through the water-bearing strata.

Dry ice does not pack the strata or harm the casing but, rather, washes the clay away from the gravel as it forces the water back and forth through the water bearing formation.

Dry ice is relatively cheap and easy to obtain. Care must be exercised, however, in its use. The dry ice should be kept in an airtight container until you are ready to put it into the well. Heavy gloves or tongs should be used in handling it in order to prevent burning or freezing of the hands.

The best results will be obtained if the ice is broken up into small pieces. Ordinarily, 10 or 15 pounds of ice will create enough gaseous pressure for the operator to judge the proper amount to use. Then, if feasible, 25 to 50 pounds can be put into the well and the results observed.

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Sales Aces for
Every Driller!
Win good will — and watch your profits mount — by making a Myers Pump installation part of every well-drilling job. Myers backs you to the limit — with unbeatable products, unequalled promotion help.
Vertical type Ejecto for deep wells. Other types for every need.
TAKE OFF YOUR HAT TO
MYERS
THE F. E. MYERS & BRO. CO.
Dept. P-33, Ashland, Ohio

Drills Record Well In New Jersey City

VETERAN driller Harry L. Parkhurst, 70, climaxed a half century of North Jersey drilling recently by bringing in a record flow of 400 gpm at 350 feet, while putting down an air-conditioning well for a department store in Montclair, New Jersey. According to Parkhurst, the generous flow of water is probably the best ever struck at that level in the Montclair area. An earlier well, also drilled to supply water for the store's air-conditioning system, was completed at 500 feet with a flow of 250 gpm. Parkhurst indicated that was about average. A 3,000-pound drill was used on the two wells.

Snellenberger . . .

(Continued from page 7)

greater every inch of the way until the 10-foot pull was completed. The well was allowed to flow for some time before the stem and pipe were taken off the strainer. A swedge block was then placed on the end of the stem and, with the weight of the stem adding force, swedged out the lead packer in place, completing the job.

His most unusual job, and likewise his most troublesome one, was reserved for another day, however. It all happened early this year when a farmer, running a dairy farm south of Osceola, Ind., had the screen in his two-inch farm well plug up at 45 feet.

Because a neighbor was getting a good supply of water at a depth of 90 feet, this dairy farmer decided to deepen his well to that depth and called in Snellenberger in January to handle the job. The South Bend driller little realized, at the time, that he'd be spending the better part of three months on the job, drilling

Make hole faster with HI-LASTIC WIRE LINE

Macwhyte Hi-Lastic's "built-in" elasticity allows tools to strike sharp, hard blows. It keeps the bit turning better . . . reduces tendency for the hole to get out of round and for the bit to channel. Like all Macwhyte's Wire Lines, Macwhyte "Hi-Lastic" Line is internally lubricated. Circular lists and describes all Macwhyte Cable Tool Drilling and Sand Lines.

Ask for Circular No. 49-14

965

Get the correct line for your equipment from

MACWHYTE COMPANY

2939 Fourteenth Avenue, Kenosha, Wisconsin, or any authorized Macwhyte Distributor or Mill Depot

steadily whenever the winter thaws and spring rains permitted.

In a first attempt Snellenberger drove down to the proposed 90 foot level, with little trouble at all, only to find no water there. At the farmer's request to go down deeper, Snellenberger proceeded to drill a hole ahead of the casing. At a depth of 126 feet a small quantity of gravel was encountered. In this operation, the driller did not drive down any additional casing but simply drilled the footage out by forcing water under pressure from his jetting pump through the jet hose to his drill rods, and on through the drill point and back up the well casing to his water tank.

The Indiana contractor then drove pipe down to the gravel deposit he had hit but, finding nothing there to set a screen in, he went down six more feet to rock, a satisfactory base for the screen. When he tried pumping, however, there was still no flow. So, he finally decided to insert a charge of dynamite and to blast the well. When no flow resulted, the well was abandoned.

• Setting up a windmill on the F. M. Jackson farm near South Bend. The 95-foot well was to pump water for the owner's fish pond. Charley's son, Richard, stands alongside the rig.

Snellenberger then moved over 20 feet, went down to 130 feet, and hit the same rock formation. At this point, the farmer decided to pull out the old well and to replace the screen in its original location. Under test, however, the well failed to produce a flow at the same depth from which the farmer had obtained his water supply for many years.

As a last resort, Snellenberger moved his rig about 70 to 80 feet away from the first well site, and began to drill again. At a depth of 46 feet, the well was in and produced a flow of 750 gph.

Snellenberger is very particular about caring for all of his equipment, realizing that he must always be in a position to give the potential customer the well he wants when he wants it. He maintains his own basement workshop which is equipped with a small 12x24-inch lathe, a drill press, electric drills and grinders, and both electric and acetylene welding equipment. He builds his own tools and drill stems.

Operating in an area in which many other drillers are located, Snellenberger realizes that he must take some measures to keep business coming in. Towards this end, he advertises his drilling activities in the classified section of the South Bend telephone directory. He maintains, however, that the best foundation for a successful business is the word-of-mouth advertising of satisfied customers. "Do honest and good work," he says. "That's the best guarantee there is for finding prospects and closing sales."

WIT BITS

Once upon a time there was a boy penguin and a girl penguin who met at the Equator. After a brief but charming interlude, the boy penguin went north to the North Pole; the girl penguin went south to the South Pole.

Later on, a telegram arrived at the North Pole, stating simply: "Come quick—I am with Byrd."

Strange how typographical errors in the news sometimes bring out the real truth in an item. The following appeared in a Kansas newspaper recently: "The doctor felt the patient's purse and announced there was no hope."

Mrs. Fussy: "Are these chickens fresh?"

Butcher: "Fresh? Why, lady, if I had an iron lung I could revive them."

The wife of a well-to-do industrialist was in the act of instructing the new maid in her duties:

"Sometimes," said the mistress, "it will be necessary for you to help the butler upstairs."

"I understand, madam," replied the girl, "I drink a bit myself, sometimes."

A young minister, called to perform his first marriage ceremony in a small town, was extremely nervous on the occasion. The bashful couple remained standing after he had finished the rites and in a brave attempt to round off the affair, he stammered: "It's all over now. Go and sin no more!"

Minister (pinching little boy's fat legs): "Who's got nice fat chubby legs?"

Little Boy: "Mama has."

Driller's wife (leaving on vacation): "Now, Henry, don't forget about watering the plants, goldfish and canary."

Husband: "Yes, m'dear!"

Wife (as an afterthought): "And I suggest you try drinking some of it yourself occasionally while I'm away."

A drill operator had looked long and fruitlessly for a room to rent, and finally saw a sign on a house: "Apartment to let." He was shown what the accommodations were by a very pretty servant girl.

Drill operator: "Are you a part of the apartment?"

Servant girl: "No, sir. The apartment is 'to let,' but I am to be let alone."

Little Susie's hair crackled, as her mother was combing it.

"Why does it crackle?" the child asked.

"Because it has electricity in it," replied her mother.

"Gee," the little miss exclaimed, "we're sure in the groove. I got electricity, Grandpa's got gas on his stomach, and Daddy's all lit."

Employer (interviewing applicant for job): "Know anything about electricity?"

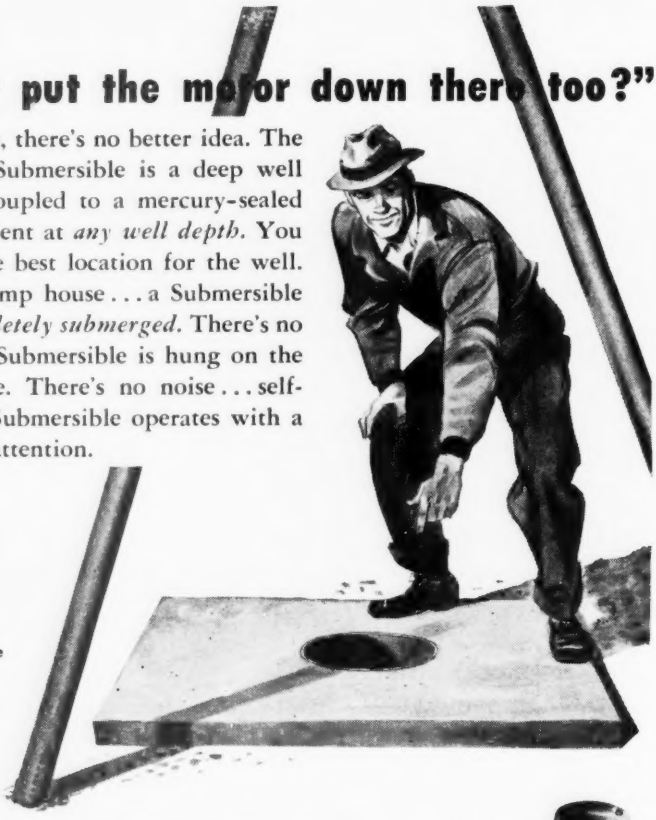
Applicant: "Yes sir!"

Employer: "What's an armature?"

Applicant: "A guy who boxes for nothin'!"

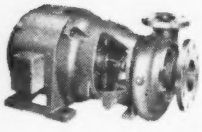
"why not put the motor down there too?"

For deep wells, there's no better idea. The exclusive BJ Submersible is a deep well pump, close-coupled to a mercury-sealed motor . . . efficient at *any well depth.* You can choose the best location for the well. There's no pump house . . . a Submersible operates *completely submerged.* There's no shafting . . . a Submersible is hung on the discharge pipe. There's no noise . . . self-lubricated, a Submersible operates with a minimum of attention.



Submersible

For wells of medium depth, propose the vastly improved BJ Deepwell Turbine . . . first developed by BJ in 1901, the new 1949 model has the finest "above ground" appearance of any pump on the market and, like all BJ Pumps, carries the *guaranteed performance* label.



For general utility, advise a compact, single stage, single suction, close-coupled BJ Bilt-on Centrifugal Pump. Act now. Byron Jackson has territories open for dealers. Specialists in the pump field since 1872, Byron Jackson can help you offer more customers a better deal with a complete line of centrifugal pumps.

Deepwell Turbine

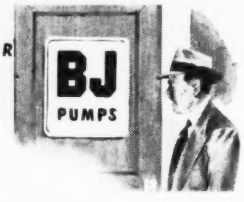
A GOOD SIGN FOR YOUR DOOR

Byron Jackson Co.

Since 1872

Los Angeles 54, California • Offices in principal cities

PLANTS: LOS ANGELES • BETHLEHEM • HOUSTON • FRESNO



Bargain Counter

All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: 30c per line. Minimum charge $1.20. No discounts; no commissions. Count your own copy to avoid delay. The average line contains 28 characters (20 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number if blind advertisement is desired. Closing date—10th of preceding month. Example — January issue closes December 10th. Be sure to address separate inquiries to each advertiser by using the correct box numbers. Mail Box inquiries care of THE DRILLER, South Milwaukee, Wis.

DRILLS FOR SALE

240 Speed Star drill, excellent cond., with cables and 4" or 5" tools; mounted on 1941 Dodge C.O.E. truck; ready to go to work. Drill 2 years old. Will sell with or without truck and tools. Bargain. H. Hollmann, 28 S. Delaplaine Rd., Riverside, Ill.; Tel. Riverside 5948.

No. 71 Speed Star, semi-trailer mounted, 15 months old. A-1 shape. 40 ft. derrick, casing reel. With or without 6" and 8" drilling tools. Telephone or write Harold E. Dorsey, Box 134, Ripon, Wisconsin.

Bucyrus-Erie 24-W drilling machine mounted on 2½-ton Diamond T truck. Machine is powered by U6 International power unit, complete with derrick hoist, cat heads, hoisting drum, etc., machine and truck in good condition. Hoeg & Ames, Lincoln, Iowa.

DRILLS FOR SALE

One 3¼ Keystone machine mounted on Gilder truck, pneumatic tires, with or without tools, price $2000. Box 313

Bucyrus-Erie 23-P well drill in good running order. Mounted on 1939 International 1½-ton truck in good shape. Price $2000, without tools. Peter Pilgard, Palatine Road, Arlington Heights, Illinois.

Star drill No. 71 complete with truck and cables. Reasonably priced, good condition. Stevens-Southern Company, 2555 West Beaver St., Jacksonville, Fla.

Completely rebuilt Ideco 16 with power derrick hoist. Hoist operates off power take-off—'47 Chevrolet truck with two speed transmission, 11,000 miles. With tools, ready to run. Box 311

Business for Sale

Well established well drilling and pump business in central Wisconsin. Modern Bucyrus-Erie equipment including full line of drilling and fishing tools for 4" to 24" wells. Also trucks, forges and everything to make up a complete well drilling and pump service. A real opportunity. Box 282

Used water well drilling machines. "Shurhit," Bucyrus-Erie and other makes. Write, wire or see them at the Burton Welding Company, G-4456 So. Dort Hwy., Flint 7, Michigan. Phone Shop 4-1483, Res. 4-7747.

Keystone 70 mounted on 1936 Federal truck with complete string of tools. Motor recently overhauled. Ready for immediate sale. Price $2,000. J. D. Korkes, Box 244, Highland Ave., Whippany, N. J., Phone 8-0030W.

DRILLS FOR SALE

Bucyrus-Erie 22-W, excellent condition, mounted on very good 1941 Chevrolet with 2-speed axle. This machine is equipped with spooling device, casing reel, slack line holder and power hoist on derrick. Cost over $5,000, will sell for $3,400. Earl Acker, Rt. 14, Box 632, Milwaukee 14, Wis. (Bluemound Rd. at 130th St.)

Sparta drilling machine No. 10. Four wheel trailer mounting. 300' drill cable and sand line. Priced for quick sale. $500. Lloyd Scott, R. R. No. 1, Box 109, Black Creek, Wis.

One 1½ Keystone machine mounted on White truck, solid tires, with or without tools. Price $1250. Box 312

MISC. FOR SALE

One 2-ton Hydrocrane with clamshell digging bucket, mounted on 1½-ton Chevrolet truck. Completely reconditioned, guaranteed. Ideal for digging slush pits, septic tank and cesspool work. For information in detail, contact J. P. Waite, Inc., 3304 W. Pierce Street, Milwaukee, Wisconsin.

10,000 ft. of 5-3/16" I. D. T & C 14 lb. casing.
10,000 ft. of 6⅝" I. D. T & C 17 lb. casing.
5,000 ft. of 8¼" I. D. T & C 24 lb. casing.
All of the above pipe is in excellent condition, ready for immediate delivery by truck or railroad car.
This pipe is priced to sell.
No order too small to get our immediate attention.
Write, Wire or Phone
THE INTERSTATE PIPE & SUPPLY COMPANY, MARIETTA, OHIO PHONE 2468

(continued on page 30)

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HELP WANTED

Experienced Drillers Wanted

Newly organized Brazilian subsidiary of an American well drilling company, specializing in large capacity wells, looking for first class drillers with only best of references to operate new 71 Star machines working both on hard rock and sand and gravel screen jobs using Johnson's well screen. Only top grade men wanted. Transportation furnished by air from U. S. A. to Rio de Janeiro and to job sites. Men with previous foreign experience desired. Salary $800 per month. Written applications only. Address communication to Commercial Drilling Company, Inc., 2036 East 22nd Street, Cleveland 15, Ohio.

Two experienced cable tool drillers for sand and gravel work on Long Island and vicinity 22 and 24 Bucyrus-Erie rigs. Write, stating experience, age and references. Long Island Water Supply Co., Inc., Syosset, Long Island, N. Y.

Water Levels Drop In Three Cities

A MARKED decline in groundwater levels in three Midwestern cities, where ground water is used extensively for air-conditioning and municipal purposes, was reported in the monthly water bulletin of the U. S. Geological Survey for July. The three municipalities referred to were Milwaukee, Wisconsin; Lansing, Michigan; and Louisville, Kentucky.

According to the bulletin, water levels in the Cambrian sandstones underlying the Milwaukee area reached an all-time low at the month-end and were continuing to decline as a result of heavy pumping.

In Michigan, the report continued, the water levels in observation wells that tap the Parma and Saginaw sandstones declined from 1.7 to 13.2 feet in the urban Lansing area, owing to continued peak-rate pumping of air-conditioning and municipal-supply wells. In the outlying rural areas near Lansing, the decline was substantially less, ranging from 0.1 to 4.9 feet.

Continued pumping for air-conditioning in Louisville, the bulletin concluded, resulted in the lowering of the water table in the downtown area by 2.9 feet during July. This was indicated by readings taken in an observation well at Fourth and Guthrie Streets. The elevation of 376.53 feet (msl) on July 29 was 2.4 feet lower than a year ago and 1.3 feet below the record-low level of September 22, 1948.

Oster Announces Pipe Threader And Geared Die-Stock

A NEW portable pipe threading machine, the No. 522 De Luxe "Pipe Master," and a new geared die-stock, the No. 52 "Leader," were recently introduced by the Oster Mfg. Co., Cleveland, Ohio. According to the manufacturer, the threading machine has a regular pipe range of ¼- to 2-inch pipe; extra range ⅛-inch pipe; extended range of 2½- to 8-inch pipe when used with drive shaft and geared die-stock.

Designed for light socket connection, the complete machine is regularly furnished for bench use. The Oster firm has indicated, however, that it can be furnished on either a steel stand with 16-inch plain wheels or on a pipe leg stand with tool tray.

The "Leader" is a ratchet type, receding die-stock, designed for fast, easy threading of 1- to 2-inch pipe, it is claimed. The manufacturer has indicated that the Leader's die-holders are separate units, fully adjustable for oversize or undersize threads. It is also equipped with three fully serrated jaws and locking screw, designed to assure quick, accurate centering on the pipe.

Check The New 20-W's 'BIG TEN' FEATURES...

...They Mean Faster, More Profitable Drilling for You!

1. GEAR-DRIVEN BULL REEL — Friction-clutch controlled. Free wheeling, too, for rapid tool running.
2. BOX-SECTION DERRICK — All steel, all-welded, 32-foot single-piece, tapered box-section derrick with built in jackscrew.
3. POWER DERRICK HOIST — Friction driven power hoist permits quick setups and knock downs, cuts costly down-time.
4. SLACK LINE HOLDER — Spring-loaded shoe on heel sheave prevents excessive slack on bull reel, reduces drum and cable wear.
5. COUNTER WEIGHTED SPUDDING GEAR — Prevents dead centering of pitman.
6. AUTOMATIC FEED — Vernier control on bull reel brake eliminates hand feeding.
7. ENGINE TAKE-OFF CLUTCH — For added convenience and safety, there's a disc type power take-off clutch in the engine housing.
8. TOOL CARRYING EQUIPMENT — Carrier bracket at derrick foot plus chain "boomer" keeps tools in place on job-to-job moves.
9. GEAR DRIVEN CASING REEL — Offered as optional equipment at a low extra cost, this free wheeling reel permits handling heavy casing loads.
10. CLUTCH CONTROLLED CATHEADS — Two 8" diameter cat heads, one for each side of rig, are available as special equipment.

The new Bucyrus-Erie 20-W, successor to the highly popular 21-W, is a small rig with big rig ideas. Hard hitting, tough, and smooth working, it has all the qualities of a true All-American. The long proven features that have made Bucyrus-Erie drills outstanding have been retained, and a "Big Ten" lineup of new, tried and tested features has been added. Call your plays with the new 20-W and watch it hit pay dirt for you on your well drilling jobs! Write for bulletin today!

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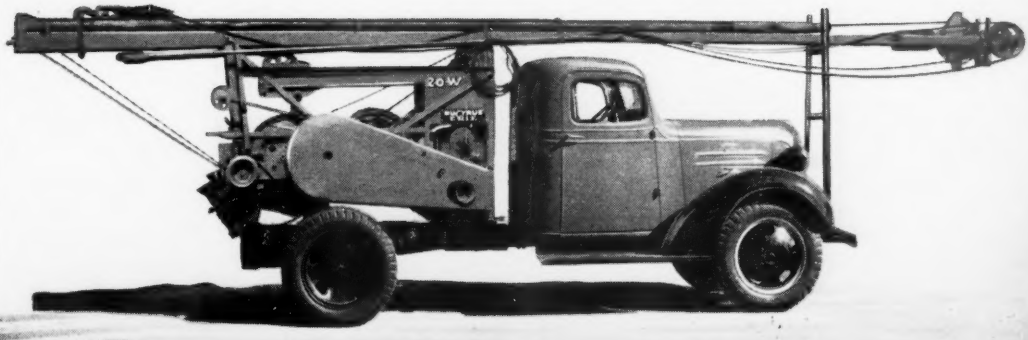

BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

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The **DRILLER**

A journal for water well drillers

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